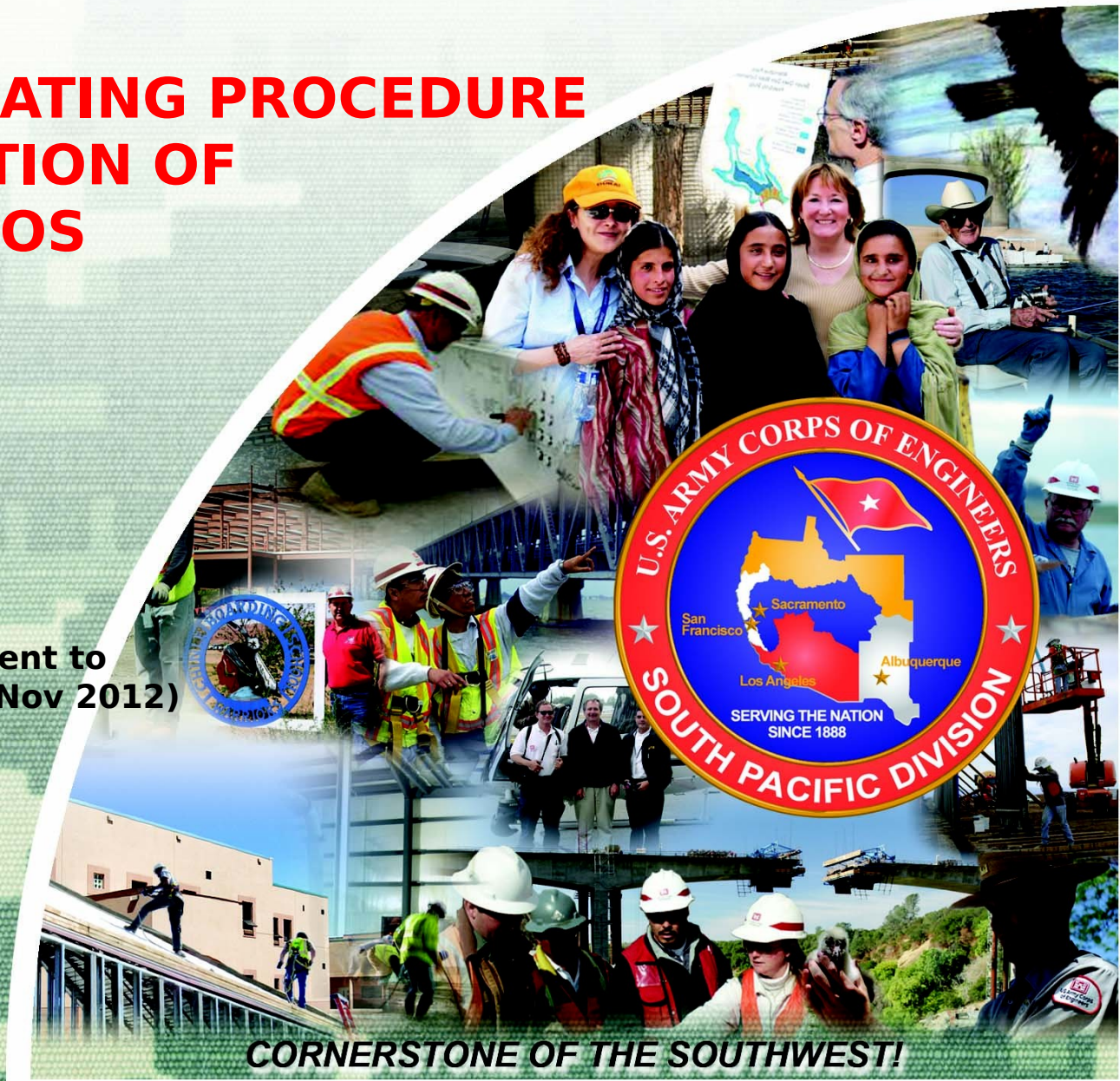
South Pacific Division

STANDARD OPERATING PROCEDURE FOR DETERMINATION OF MITIGATION RATIOS



November 2012

(12501.5-SPD – An attachment to 12501-SPD – Current to 30 Nov 2012)

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Summary

- General details
- List of documents
- Procedure: flow chart
- Checklist
- Instructions
- Examples
- FAQ’s
- January and August 2012 updates: list of changes
- POC’s

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STANDARD OPERATING PROCEDURE FOR DETERMINATION OF MITIGATION RATIOS

US Army Corps of Engineers

12501-SPD
REGULATORY PROGRAM
STANDARD OPERATING PROCEDURE
FOR DETERMINATION OF
MITIGATION RATIOS

South Pacific Division

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1.0 Purpose. The purpose of this document is to outline the process for determining compensatory mitigation requirements as required for processing of Department of the Army (DA) permits under Section 404 of the Clean Water Act, Section 10 of the Rivers and Harbors Act, and Section 103 of the Marine Protection, Research, and Sanctuaries Act. .

2.0 Applicability. This process applies to the Regulatory Program within South Pacific Division (SPD), including its four subordinate districts, Albuquerque District (SPA), Sacramento District (SPK), Los Angeles District (SPL),and San Francisco District (SPN). Subordinate offices or organizations shall not modify this procedure to form a specific procedure. This procedure is applicable for all permit applications received after 20 April 2011.

3.0 References.

Compensatory Mitigation for Losses of Aquatic Resources (33 C.F.R. Part 332).

Smith, R. D., D. R., A. Ammann, C. Bartoldus, M. M. Brinson. 1995. An Approach for Assessing Wetland Functions Using Hydrogeomorphic Classification, Reference Wetlands, and Functional Indices., Wetlands Research Program Technical Report WRP-DE-9. U.S. Army Corps of Engineers, Waterways Experiment Station, Vicksburg, Mississippi.

Cowardin, L. M., V. Carter, F. C. Golet, E. T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U. S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. Jamestown, ND: Northern Prairie Wildlife Research Center Home Page. http://www.npwrc.usgs.gov/resource/1998/classwet/classwet.htm (Version 04DEC98).

Collins, J.N., E.D. Stein, M. Sutula, R. Clark, A.E. Fetscher, L. Grenier, C. Grosso, and A. Wiskind. 2008. California Rapid Assessment Method (CRAM) for Wetlands. Version 5.0.2. 151 pp.

4.0 Related Procedures.

None.

5.0 Definitions.

Compensatory mitigation - The restoration (re-establishment or rehabilitation), establishment (creation), enhancement, and/or in certain circumstances preservation of aquatic resources for the purposes of offsetting unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved.

Condition - The relative ability of an aquatic resource to support and maintain a community of organisms having a species composition, diversity, and functional organization comparable to reference aquatic resources in the region.

Enhancement - The manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s). Enhancement results in the gain of selected aquatic resource function(s), but may also lead to a decline in other aquatic resource function(s). Enhancement does not result in a gain in aquatic resource area.

Establishment (creation) - The manipulation of the physical, chemical, or biological characteristics present to develop an aquatic resource that did not previously exist at an upland site. Establishment results in a gain in aquatic resource area and functions.

Functions - The physical, chemical, and biological processes that occur in ecosystems.

Impact - Adverse effect.

In-kind - A resource of a similar structural and functional type to the impacted resource.

In-lieu fee program - A program involving the restoration, establishment, enhancement, and/or preservation of aquatic resources through funds paid to a governmental or non-profit natural resources management entity to satisfy compensatory mitigation requirements for DA permits.

Mitigation Ratio-Setting Procedure

- **Finalized April 20, 2011, by regional PDT (2 year effort)**
- **1st update January 2012, 2nd update August 2012**
- **Benefits:**
  - **Provides structured decision-making procedure while retaining flexibility**
  - **Allows for qualitative or quantitative assessments of impacts & mitigation**
  - **Results in a written rationale (decision document) for each ratio determination**
  - **Includes guidance for each step of checklist**
- **Incorporates use of functional/condition assessments when available/required**

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Mitigation Ratio-Setting Procedure

- **STANDARD OPERATING PROCEDURE FOR DETERMINATION OF MITIGATION RATIOS**

  - **1 Flowchart**

  - **4 Attachments**
    - ✓ **1. Mitigation Ratio Setting Checklist**
    - ✓ **2 . Revised: Instructions**
    - ✓ **3. Expanded: Examples**
    - ✓ **4. Checklist Step 3, BAMI spreadsheet**
    - ✓ **5. Revised: This training presentation**
    - ✓ **6. New: Checklist in Excel format**

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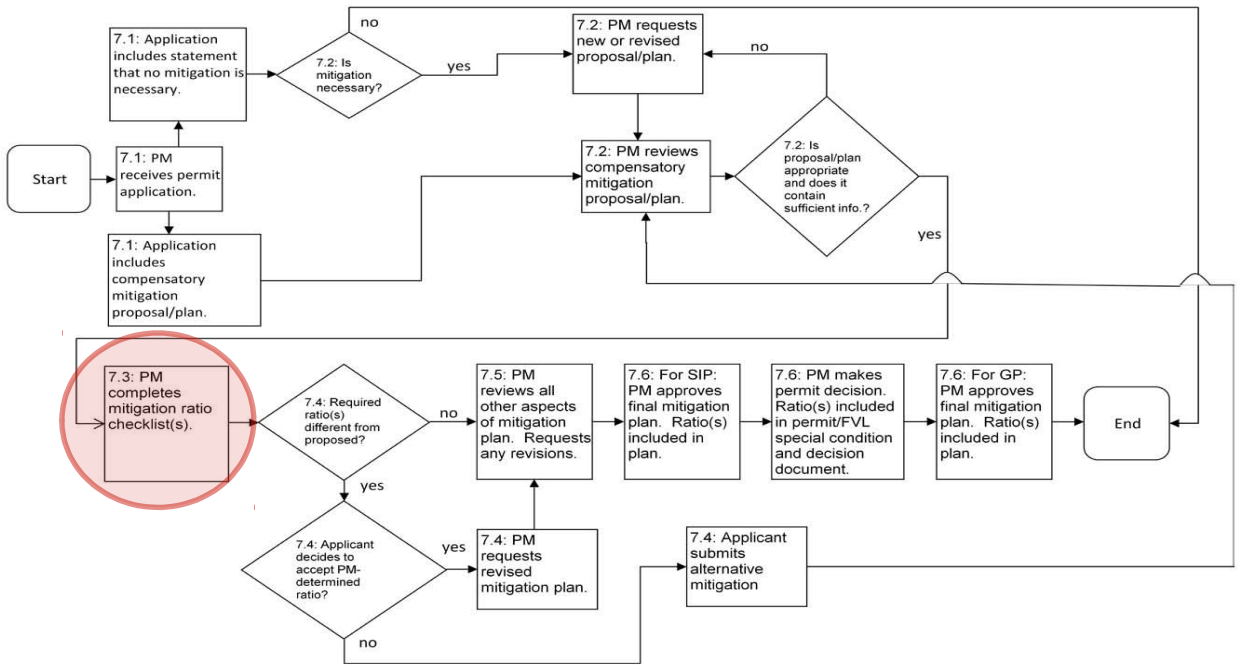
Mitigation Ratio Setting Flow Chart

10.0 Flow Chart.


Start
7.1: PM receives permit application.
7.1: Application includes statement that no mitigation is necessary.
7.2: Is mitigation necessary?
no
yes
7.2: PM requests new or revised proposal/plan.
no
7.1: Application includes compensatory mitigation proposal/plan.
7.2: PM reviews compensatory mitigation proposal/plan.
7.2: Is proposal/plan appropriate and does it contain sufficient info.?
yes
7.3: PM completes mitigation ratio checklist(s).
7.4: Required ratio(s) different from proposed?
no
yes
7.5: PM reviews all other aspects of mitigation plan. Requests any revisions.
7.6: For SIP: PM approves final mitigation plan. Ratio(s) included in plan.
7.6: PM makes permit decision. Ratio(s) included in permit/FVL special condition and decision document.
7.6: For GP: PM approves final mitigation plan. Ratio(s) included in plan.
End
7.4: Applicant decides to accept PM-determined ratio?
yes
no
7.4: PM requests revised mitigation plan.
7.4: Applicant submits alternative mitigation

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Attachment 1 (page 1) SPD Mitigation Ratio Setting Checklist

Attachment 12501.1 - SPD Mitigation Ratio Setting Checklist

1	Date: _____ Corps file no.: _____ Project Manager: _____ Impact site name: _____ ORM impact resource type: _____ Impact Cowardin or HGM type: _____ Impact area (acres): _____ Impact distance (linear feet): _____	Column A: Mitigation site name: _____ Mitigation type: _____ Resource type: _____ Cowardin/HGM type: _____	Column B (optional): Mitigation site name: _____ Mitigation type: _____ Resource type: _____ Cowardin/HGM type:	Column C (optional): Mitigation site name: _____ Mitigation type: _____ Resource type: _____ Cowardin/HGM type:
2	**QUALITATIVE impact-mitigation comparison**: Has a Corps-approved functional/condition assessment been obtained? If not, complete step 2; otherwise, complete step 3. Yes ☐ No ☐	Note: steps 2 and 3 are mutually exclusive. If step 2 is used, then complete the rest of the checklist (steps 4-10). Starting ratio: 1:1 Ratio adjustment: ___ Baseline ratio: __:__ PM justification:	Starting ratio: 1:1 Ratio adjustment: ___ Baseline ratio: __:__ PM justification:	Starting ratio: 1:1 Ratio adjustment: ___ Baseline ratio: __:__ PM justification:
3	**QUANTITATIVE impact-mitigation comparison**: Use step 3 if a Corps-approved functional/condition assessment been obtained. Use Before-After-Mitigation-Impact (BAMI) spreadsheet (attachment 12501.4) (if a district-approved functional/condition method is not available, use step 2 instead). See example in attachment 12501.2.	Note: steps 2 and 3 are mutually exclusive. If step 3 is used, steps 3 and 5 may also be mutually exclusive. If a functional/ condition assessment method is used that explicitly accounts for area (such as HGM), steps 3 and 5 are mutually exclusive; however, if a method is used that does *not* explicitly account for area (such as CRAM), then both steps should be used. Complete the rest of the checklist (steps 4-10 or steps 4 and 6-10, as appropriate). Baseline ratio from BAMI procedure (attached): __:__	Baseline ratio from BAMI procedure (attached): __:__	Baseline ratio from BAMI procedure (attached): __:__
4	**Mitigation site location**:	Ratio adjustment: PM justification:	Ratio adjustment: PM justification:	Ratio adjustment: PM justification:

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Attachment 1 (page 2)
SPD Mitigation Ratio Setting Checklist

5	**Net loss of aquatic resource surface area**:	Ratio adjustment: PM justification:	Ratio adjustment: PM justification:	Ratio adjustment: PM justification:
6	**Type conversion:**	Ratio adjustment: PM justification:	Ratio adjustment: PM justification:	Ratio adjustment: PM justification:
7	**Risk and uncertainty**:	Ratio adjustment: PM justification:	Ratio adjustment: PM justification:	Ratio adjustment: PM justification:
8	**Temporal loss**:	Ratio adjustment: PM justification:	Ratio adjustment: PM justification:	Ratio adjustment: PM justification:
9	**Final mitigation ratio(s):**	Column A: 1. Baseline ratio from step 2 or 3 = __:__ 2. Total adjustments = ___ 3. Final ratio: __ : __ Proposed impact (total): ___ acre ___ linear feet to Resource type: _____ Cowardin or HGM: _____ Required mitigation: ___ acre ___ linear feet of Mitigation type: _____ Resource type: _____ Cowardin or HGM: _____ Additional PM comments:	Column B: 1. Baseline ratio from step 2 or 3 = __:__ 2. Total adjustments = ___ 3. Final ratio: __ : __ Remaining impact: _____ Required mitigation: ___ acre ___ linear feet of Mitigation type: _____ Resource type: _____ Cowardin or HGM: _____ Additional PM comments:	Column C: 1. Baseline ratio from step 2 or 3 = __:__ 2. Total adjustments = ___ 3. Final ratio: __ : __ Remaining impact: _____ Required mitigation: ___ acre ___ linear feet of Mitigation type: _____ Resource type: _____ Cowardin or HGM: _____ Additional PM comments:
10	**Final compensatory mitigation requirements:**	PM summary:		

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Attachment 2
Instructions (step 1)

All steps in checklist are additive

Attachment 12501.2-SPD - Instructions for Completing Mitigation Ratio-Setting Checklist.

These instructions contain specific numeric adjustments (discrete, e.g., +1.0, or ranges, e.g., +0.25 to +4.0) that were determined by the PDT after assessing a variety of impact-mitigation scenarios and determining adjustments for each step that, in combination with other step adjustments, produce a reasonable range of final mitigation ratios. For steps where a range of adjustments is provided, PMs are directed to the attached examples for additional guidance. PMs **must** enter a separate justification for each adjustment within the checklist. PMs may deviate from the guidance provided herein if such deviations can be documented in the checklist with sufficient justification.

1

Date: _____ Corps file no.: _____ Project Manager: _____

Impact site name: _____ ORM impact resource type: _____
Cowardin or HGM type: _____ Impact area (acres): _____ Impact distance (linear feet): _____

For impact site name, multiple discrete (as entered in ORM) impacts are to be evaluated using multiple checklists; however, multiple impacts to one habitat type (Cowardin or HGM) could be lumped together to determine a mitigation ratio using one checklist. For each proposed impact to waters of the U.S., the project manager (PM) should consider each factor and, if applicable, document consideration in response column(s) using applicable procedures or guidelines. For mitigation proposals with multiple mitigation sites and/or types, see QMS procedure 12501 (section 7.3).

Column A:	Column B (optional):	Column C (optional):
Mitigation site name: _____	Mitigation site name: _____	Mitigation site name: _____
Mitigation type: _____	Mitigation type: _____	Mitigation type: _____
Resource type: _____	Resource type: _____	Resource type: _____
Cowardin/HGM type: _____	Cowardin/HGM type: _____	Cowardin/HGM type: _____

Generally, one impact site per checklist.

Use either Cowardin *or* HGM classification system for impact and mitigation sites within a checklist, not both.

Write in mitigation type, but not the amount. Could be applicant's proposal or project manager's proposal

Complete column A first for steps 1-9, then B 1-9 (if needed), then C (if needed). Then combine results in step 10.

Alternative ways of using checklist columns:
A only (1 mitigation site/type)
A and B (2 mitigation sites/types)
A, B, and C (3 mitigation sites/types)
A vs. B (compare two proposals)

Attachment 2
Instructions (step 2)

2	**QUALITATIVE impact-mitigation comparison**: Has a Corps-approved functional/condition assessment been obtained? If not, complete step 2; otherwise, complete step 3. Yes ☐ No ☐ Qualitative assessment of functional loss at the impact site versus expected functional gain at the mitigation site may warrant a lower or higher mitigation ratio. Note: adjustments for preservation-only mitigation, which provides no functional gain, should generally fall towards the high end of the range (towards 3-4). Preservation-only of non-aquatic habitats (upland buffer) may warrant adjustments higher than 4. Using the list of functions below, compare impact (functional loss) and proposed mitigation (functional gain) at impact (I) and mitigation (M) sites. For most functions, if I < M, then use adjustment less than 0 and equal or greater than -2.0; if I = M, then use adjustment of 0; or if I > M, then use adjustment greater than 0 and less than or equal to 4. Add adjustment to starting ratio of 1:1 to obtain baseline ratio. If adjustment is less than 0 (negative), add ABS of adjustment to right (impact) side of starting ratio; otherwise, add to left (mitigation) side. See examples in attachment 12501.3. Suite of potential functions from HGM (alternate lists of functions may be used): a. Short- or long-term surface water storage b. Subsurface water storage c. Moderation of groundwater flow or discharge d. Dissipation of energy e. Cycling of nutrients f. Removal of elements and compounds g. Retention of particulates h. Export of organic carbon i. Maintenance of plant and animal communities	Note: steps 2 and 3 are mutually exclusive. If step 2 is used, then complete the rest of the checklist (steps 4-10). Starting ratio: 1:1 Ratio adjustment: ___ Baseline ratio: __:__ PM justification:	Starting ratio: 1:1 Ratio adjustment: ___ Baseline ratio: __:__ PM justification:	Starting ratio: 1:1 Ratio adjustment: ___ Baseline ratio: __:__ PM justification:

Note: acreage/ linear foot threshold removed

PM justification MUST be filled out for each adjustment (each step that is completed).

Not a numeric comparison. No calculations necessary.

"Starting ratio" now 1:1

Step 2 adjustment added to 1:1 starting ratio to obtain "baseline ratio"

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Attachment 2 nstructions (steps 3-4

Suggestion: when determined to be appropriate, project managers should request functional/condition assessment analysis early in the application process!

Add baseline ratio from BAMI spreadsheet

3	**QUANTITATIVE impact-mitigation comparison**: Use step 3 if a Corps-approved functional/condition assessment been obtained. In general, project managers should consider requiring a functional/condition assessment and using step 3 for projects where total permanent impacts exceed 0.5 acre or 300 linear feet. Acceptable functional/condition assessment methods must be aquatic resource-based, standardized, comparable from site to site, peer-reviewed, unmodified, and approved by the applicable Corps District. If a district-approved method is not available, use step 2. Use Before-After-Mitigation-Impact (BAMI) spreadsheet (attachment 12501.4) (if a district-approved functional/condition method is not available, use step 2 instead). See example below. Note: In an extreme case, the BAMI procedure could result in a ratio (and overall mitigation proposal) unacceptable to the Corps. For example, providing a very large but low quality mitigation site (low functional gain resulting a in a very high ratio) may result in functional gain equaling loss numerically, but this may not be acceptable because the required compensatory mitigation must be appropriate to the scope and degree of the impacts (see 33 CFR 320.4(r)(2)).	Note: steps 2 and 3 are mutually exclusive. If step 3 is used, steps 3 and 5 may also be mutually exclusive. If a functional/ condition assessment method is used that explicitly accounts for area (such as HGM), steps 3 and 5 are mutually exclusive; however, if a method is used that does *not* explicitly account for area (such as CRAM), then both steps should be used. Complete the rest of the checklist (steps 4-10 or steps 4 and 6-10, as appropriate). Baseline ratio from BAMI spreadsheet (attached): __:__	Baseline ratio from BAMI procedure (attached): __:__	Baseline ratio from BAMI procedure (attached): __:__
4	**Mitigation site location**: Mitigation located outside impacted watershed generally warrants higher mitigation ratio. The PM will determine the appropriate Hydrologic Unit Code (HUC) to define the term "watershed" in this context. Is mitigation located outside of the impacted watershed? If yes, +1.0, if no, +0.	Ratio adjustment: PM justification:	Ratio adjustment: PM justification:	Ratio adjustment: PM justification:

Note correction (2,5 vs. 3). See FAQ.

Upcoming regional mitigation and monitoring guidelines will recommend functional/condition assessment methods.

Extreme cases addressed here.

Attachment 2: Instructions (step 3 – CRAM example)

Another appropriate method can be substituted. PM's can adapt BAMI spreadsheet to their functional/condition assessment method and enter data provided by applicant.

Attachment 12501.4-SPD - Before-After-Mitigation-Impact (BAMI) procedure (CRAM example)

Functions/conditions	$Impact_{Before}$	$Impact_{After}$	$Impact_{delta}$	$Mitigation_{Before}$	$Mitigation_{After}$	$Mitigation_{delta}$
4.1 Buffer and Landscape Context						
4.1.1 Landscape Connectivity	9	3	-6	6	6	0
4.1.2 Percent of AA with Buffer	12	6	-6	3	9	6
4.1.3 Average Buffer Width	3	3	0	3	12	9
4.1.4 Buffer Condition	6	6	0	3	9	6
RAW SCORE	**15.0**	**8.0**	**-7**	**9.0**	**15.7**	**7**
FINAL SCORE	**62.5**	**33.6**	**-29**	**37.5**	**65.3**	**28**
4.2 Attribute 2: Hydrology						
4.2.1 Water Source	6	6	0	6	6	0
4.2.2 Hydroperiod or Channel Stability	9	12	3	3	9	6
4.2.3 Hydrologic Connectivity	12	9	-3	3	12	9
RAW SCORE	**27.0**	**27.0**	**0**	**12.0**	**27.0**	**15**
FINAL SCORE	**75.0**	**75.0**	**0**	**33.4**	**75.0**	**42**
4.3 Attribute 3: Physical Structure						
4.3.1 Structural Patch Richness	6	3	-3	3	9	6
4.3.2 Topographic Complexity	6	3	-3	3		
RAW SCORE	**12.0**	**6.0**	**-6**	**6.0**		
FINAL SCORE	**50.0**	**25.0**	**-25**	**25.0**		
4.4 Attribute 4: Biotic Structure						
4.4.1 Number of Plant Layers	12	9	-3	6		
4.4.2 Co-Dominant Species	6	6	0	6		
4.4.3 Percent Invasion	6	9	3	3		
4.4.4 Interspersion/Zonation	9	3	-6	3	9	
4.4.5 Vertical Structure	6	3	-3	3	6	3
RAW SCORE	**23**	**14**	**-9**	**11**	**26**	**15**
FINAL SCORE	**63.9**	**38.9**	**-25**	**30.6**	**72.3**	**42**
OVERALL SCORE	**65.0**	**46.0**	**-19**	**32.0**	**70.0**	**38**

Since functional loss < functional gain, step 3 adjusts mitigation ratio downward (less mitigation required). 1:2 ratio is the same as a 0.5:1 ratio.

Need instructions? See next slide.

Log equation replaced with M/I (gain/loss) quotient and baseline ratio.

$Quotient=ABS(M/I)_{deltas}$
2
Baseline ratio:
1 : 2

Step 3 Instructions

Instructions:

1. Choose functional method. Acceptable functional assessment methods must be aquatic resource-based, standardized, comparable from site to site, peer-reviewed, and must be approved by the applicable Corps District.
2. List functions/condition categories in leftmost column
3. Utilize Before-After-Mitigation-Impact (BAMI) procedure above to calculate function deltas
4. Obtain absolute value (ABS*) of quotient of mitigation-delta over impact-delta for overall score (if method has no overall score, use median of quotients for function categories or individual functions. *Absolute value is the nonnegative number for any real number, so if your quotient is negative, simply drop the negative sign to get the ABS. For example: the ABS of -9/3 = 3.
5. To get baseline ratio: If quotient (Q) is less than 1, baseline ratio = 1/Q : 1; if quotient is greater than 1, baseline ratio = 1 : Q.
6. Input Step 3 baseline ratio into the checklist document

Example 1 (gain twice the loss):
$Q = ABS(M/I)_{deltas} = ABS(38 \div -19) = 2$,
Since Q is greater than 1,
Add Q to right (impact) side of ratio,
and baseline ratio = 1:Q = 1:2 = 0.5:1

Example 2 (gain a third of loss):
$Q = ABS(M/I)_{deltas} = ABS(15 \div -45) = 0.33$,
Since Q is less than 1,
Add 1/Q to left (mitigation) side of ratio,
and baseline ratio = 1/Q:1 = 1/0.33:1 = 3:1

Attachment 2
Instructions (steps 5-6)

5	**Net loss of aquatic resource surface area**: Different types of mitigation result in varying net losses of aquatic resource area. For definitions of mitigation types, see mitigation rule at 33 C.F.R. 332.2. Re-establishment or establishment +0, Rehabilitation, enhancement, preservation +1.0 (these three mitigation types result in a net loss of aquatic resource area in cases where permanent loss of waters of the U.S. is authorized and not offset by either re-establishment or establishment).	Note: If step 3 is used, steps 3 and 5 may also be mutually exclusive. If a functional/ condition assessment method is used that explicitly accounts for area (such as HGM), steps 3 and 5 are mutually exclusive; however, if a method is used that does *not* explicitly account for area (such as CRAM), then both steps should be used. Ratio adjustment: PM justification:	Ratio adjustment: PM justification:	Ratio adjustment: PM justification:
6	**Type conversion:** Out-of-kind mitigation may warrant a higher mitigation ratio. However, out-of-kind mitigation can be appropriate if the proposed mitigation habitat type serves the aquatic resource needs of the watershed/ecoregion. In considering out-of-kind mitigation, project managers should consider whether impacts or mitigation would consist of rare or regionally significant habitat types (e.g., vernal pools). PM will determine the relative values of different habitat types and document herein. Justification for the use of out-of-kind mitigation must be documented herein. Would mitigation result in: (A) conversion from a highly valuable and/or rare habitat type to a common type? Or (B) vice versa? Magnitude of adjustment should vary with value of habitats involved. Calculate ratio adjustment based on answers to questions (A) and (B): Y,N: +0.25 to +4.0; N,Y: -0.25 to -4.0; N,N: +0.	Ratio adjustment: PM justification:	Ratio adjustment: PM justification:	Ratio adjustment: PM justification:

Definition of "highly valuable" will vary across ecoregions, watersheds, etc.

Attachment 2 Instructions (step 7)

Step name changed to “Risk and uncertainty” to better reflect issues considered.

7	**Risk and uncertainty** Mitigation ratios should reflect the inherent uncertainty of mitigation. Factors to consider include: 1) Permittee-responsible mitigation; 2) mitigation site did not formerly support targeted aquatic resources; 3) difficult-to-replace resources (see 33 C.F.R. 332.3(e)(3) and (f)(2)); 4) modified hydrology (e.g., high-flow bypass); 5) artificial hydrology (e.g., pumped water source); 6) structures requiring long-term maintenance (e.g., outfalls, drop structures, weirs, bank stabilization structures); 7) planned vegetation maintenance (e.g., mowing, landclearing, fuel modification activities); 8) e.g., shallow, buried structures (riprap, clay liners), and 9) absence of long-term preservation mechanism. Note: this list is not all-inclusive. Each factor can range from +0.1 to +0.3 depending on the level of anticipated risk and the amount of maintenance or management required to sustain the compensatory mitigation project. Sum factor adjustments (+0 if no factors). Generally, uncertainty in banks and in lieu fee programs is accounted for in the credit release process.	Ratio adjustment: PM justification:	Ratio adjustment: PM justification:	Ratio adjustment: PM justification:

Note: if too many uncertainty factors are identified, this may indicate the overall mitigation proposal/design is not acceptable.

Attachment 2
Instructions (step 8)

8	**Temporal loss**: Constructed habitats take time to mature and replace aquatic functions; this typically warrants a higher mitigation ratio in cases where a delay is planned between impacts and full replacement of functions. PM should estimate the time between when the authorized impacts occur and constructed mitigation is expected to replace lost functions, including the monitoring period. In cases where all performance standards are expected to be achieved prior to impacts, no temporal loss should be assessed (for Permittee-responsible only). Similarly, in cases where interim performance standards are expected to be achieved, a lower ratio adjustment may be appropriate. Unexpected delays in compensatory mitigation project implementation should be handled as compliance actions. a. For scheduled, known delays between impacts and construction of mitigation: multiply delay (in months) by 0.05; b. To account for time required for full replacement of functions during monitoring period: generally, if mitigation is comprised of trees/woodlands or saltmarsh, +3; if shrubs, +2; if herbaceous, +1; c. Add adjustments from steps (a) and (b).	Ratio adjustment: PM justification:	Ratio adjustment: PM justification:	Ratio adjustment: PM justification:

PDT chose simple approach, rather then using complex and unvalidated temporal loss equations proposed in the literature.

Attachment 2 Instructions (steps 9-10)

Steps 9 and 10 should be project manager's independent assessment of mitigation requirements. The checklist is NOT intended to match an applicant's proposa

Remaining impact (unmitigated impact (if any) after mitigation in column A considered.

Refers to steps 2 & 3.

Remaining impact (unmitigated impact) (if any) after mitigation in column B considered

Adjustments additive

9	**Final mitigation ratio(s):** Project manager should enter the final mitigation ratio(s) arrived at after consideration of the above factors (either qualitative OR quantitative). PM should enter the extent of authorized impacts and required mitigation by area (acreage) and/or distance (linear feet), as well as the corresponding resource type (lake, non-tidal wetland, other, pond, stream/river/ocean, tidal wetland) and Cowardin or Hydrogeomorphic Method (HGM) classification type. To obtain the final mitigation ratio*: a. Take baseline ratio from step 2 or 3; b. Add ratio adjustments from steps 4-8; c. If total of adjustments is greater than 0 (positive), add total to left (mitigation) side of baseline ratio; d. If total of adjustments is less than 0 (negative), add ABS of total to right (impact) side of baseline ratio; e. Note: minimum ratio = 1:1 if step 2 used. If step 3 used, final ratio can be less than 1:1 assuming completed functional/condition assessment, in combination with other steps, justifies a ratio less than 1:1 (i.e., total of adjustments is negative)).	Column A: 1. Baseline ratio from step 2 or 3 = __:__ 2. Total adjustments = ___ 3. Final ratio: __ : __ Proposed impact (total): ___ acre ___ linear feet to Resource type: _____ Cowardin or HGM: _____ Required mitigation: ___ acre ___ linear feet of Mitigation type: _____ Resource type: _____ Cowardin or HGM: _____ Additional PM comments:	Column B: 1. Baseline ratio from step 2 or 3 = __:__ 2. Total adjustments = ___ 3. Final ratio: __ : __ Remaining impact: _____ Required mitigation: ___ acre ___ linear feet of Mitigation type: _____ Resource type: _____ Cowardin or HGM: _____ Additional PM comments:	Column C: 1. Baseli…om ste …: 2. T… …djustments = ___ …inal ratio: __ : __ Remaining impact: _____ Required mitigation: ___ acre ___ linear feet of Mitigation type: _____ Resource type: _____ Cowardin or HGM: _____ Additional PM comments:
	…nal compensatory mitigation requirements:. PM should summarize the checklist results, combining all required mitigation for this impact site.	PM summary:		

*In the final determination of required mitigation, direct and indirect impacts should be considered:

a. Indirect impacts: Compensatory mitigation may be required to offset predictable indirect impacts. The PM should document any indirect impacts caused by the proposed/authorized activity.

b. Cumulative impacts: In some cases, cumulative impacts should be considered when determining if compensatory mitigation should be required. The extent of cumulati… impacts should be documented using available information, such as analyses or data associated with a Special Area Management Plan (SAMP), Watershed Management Plan, land use/land cover scenario assessment, hydrologic modeling, etc. The information used should be fully cited herein and in the decision document. The assessme… must focus on the proposed action's direct and indirect impacts (i.e., incremental impact of the proposed activity) in the context of the cumulative effects caused by past, present, and reasonably foreseeable actions, to reduce the proposed activity's contribution to cumulative effects in the region.

IS

Text narrative of final, combined (all columns) mitigation requirement.

Use if appropriate.

Attachment 3
Examples of Mitigation Ratio Setting Checklist

Attachment 12501.3-SPD - Examples for SPD Mitigation Ratio Setting Checklist

We'll go through example #1.

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Attachment 3
Example 1 (overview)

Checklist Example 1: one impact site/type with two mitigation sites/types

Impact(s): The applicant is proposing to permanently impact 0.3 acre (870 linear feet) of intermittent stream with mature, native riparian vegetation (southern willow woodland).

Proposed mitigation: The applicant has proposed to mitigate through: 1) 0.3 acre of on-site, in-kind establishment of intermittent stream by re-aligning the existing stream such that the new alignment would be constructed across existing uplands (prior to grading to reduce elevations appropriately); and 2) 0.6 acre of off-site, out-of-kind enhancement of depressional wetland through a mitigation bank.

Method: The project manager has completed one checklist (see below), using column "A" for the on-site, proposed mitigation and column "B" for the off-site proposed mitigation.

Results: After completing the checklist columns "A" and "B", and after discussing the results with the applicant, the project manager has determined the final mitigation ratios to be 1:1 for on-site (0.3 acre, as proposed) and 4:1 for off-site (0.84 acre of enhancement credit). As part of this process, the applicant agreed to increase his/her off-site mitigation from 0.6 acre to 0.84 acre. The project manager then entered the final requirement on the last page of the checklist and added the completed checklist to the administrative record (either as a paper copy in the paper file or as an electronic file in ORM). Alternatively, the project manager and/or applicant could have proposed all on-site mitigation (0.99 acre of establishment) or all off-site mitigation (1.2 acre of enhancement) to mitigate for the proposed impact. Regardless of the outcome of any negotiations, the final mitigation ratio(s) and requirement(s) should be explicitly described in steps 9 and 10 of the checklist.

Attachment 3: Example 1 (steps 1-2)

SPD mitigation ratio setting checklist

1	Date: 5/17/2010 Corps file no.: 2010-XYZ Project Manager: John Doe Impact site name: Tullay Creek ORM impact resource type: stream Impact Cowardin or HGM type: riverine-intermittent Impact area (acres): 0.3 Impact distance (linear feet): 870	Column A: Mitigation site name: Tullay Creek Mitigation type: establishment Resource type: stream Cowardin/HGM type: riverine-intermittent	Column B (optional): Mitigation site name: WL bank Mitigation type: enhancement Resource type: non-tidal WL Cowardin/HGM type: palustrine	Column C (optional): Mitigation site name: _____ Mitigation type: _____ Resource type: _____ Cowardin/HGM type: _____
2	**QUALITATIVE impact-mitigation comparison**: Has a Corps-approved functional/condition assessment been obtained? If not, complete step 2; otherwise, complete step 3. Yes ☐ No ☒	Note: steps 2 and 3 are mutually exclusive. If step 2 is used, then complete the rest of the checklist (steps 4-10). Starting ratio: 1:1 Ratio adjustment: 0 Baseline ratio: 1:1 PM justification: impact and mitigation are within the same water body, habitat type, etc., so functional gain and loss would be equal.	Starting ratio: 1:1 Ratio adjustment: +3 Baseline ratio: 4:1 PM justification: Functional loss is greater than functional gain since in this case, there is total functional loss and only gain of selected functions via enhancement.	Starting ratio: 1:1 Ratio adjustment: ___ Baseline ratio: __:__ PM justification:

Attachment 3: Example 1 (steps 3-7)

3	**QUANTITATIVE impact-mitigation comparison**: Use step 3 if a Corps-approved functional/condition assessment been obtained. Use Before-After-Mitigation-Impact (BAMI) spreadsheet (attachment 12501.4) (if a district-approved functional/condition method is not available, use step 2 instead). See example in attachment 12501.2.	Note: steps 2 and 3 are mutually exclusive. If step 3 is used, steps 3 and 5 may also be mutually exclusive. If a functional/ condition assessment method is used that explicitly accounts for area (such as HGM), steps 3 and 5 are mutually exclusive; however, if a method is used that does *not* explicitly account for area (such as CRAM), then both steps should be used. Complete the rest of the checklist (steps 4-10 or steps 4 and 6-10, as appropriate). Baseline ratio from BAMI procedure (attached): __:__	Baseline ratio from BAMI procedure (attached): __:__	Baseline ratio from BAMI procedure (attached): __:__
4	**Mitigation site location**:	Ratio adjustment: 0 PM justification: impact and mitigation would be within the same watershed	Ratio adjustment: 0 PM justification: impact and mitigation would be within the same watershed	Ratio adjustment: PM justification:
5	**Net loss of aquatic resource surface area**:	Ratio adjustment: 0 PM justification: establishment	Ratio adjustment: +1 PM justification: enhancement	Ratio adjustment: PM justification:
6	**Type conversion:**	Ratio adjustment: 0 PM justification: n,n: no difference between impact and mitigation types	Ratio adjustment: 0 PM justification: intermittent riparian (willow woodland) and depressional wetlands not substantially different in terms of relative value.	Ratio adjustment: PM justification:
7	**Risk and uncertainty**:	Ratio adjustment: +0.3 PM justification: +0.1 for permittee-responsible mitigation, +0.2 as mitigation site did not formerly support target aquatic resource.	Ratio adjustment: 0 PM justification: mitigation bank, uncertainty factors not applicable.	Ratio adjustment: PM justification:

Attachment 3: Example 1 (steps 8-10)

8	**Temporal loss:**	Ratio adjustment: +3 PM justification: a: No planned delay, impact and mitigation to be constructed simultaneously. b: Both to include mature willow canopy (trees/woodlands), +3 to account for time to achieve full functions.	Ratio adjustment: 0 PM justification: bank, no delay	Ratio adjustment: PM justification:
9	**Final mitigation ratio(s):**	Column A: 1. Baseline ratio from step 2 or 3 = __:__ 2. Total adjustments = ___ 3.Final ratio: _3.3_ : _1_ Proposed impact (total): __0.3_ acre _870__ linear feet to Resource type: ____stream_____ Cowardin or HGM: riverine-intermittent Required mitigation: _0.3*__ acre _900__ linear feet of Mitigation type: __establishment_____ Resource type: _____same_____ Cowardin or HGM: ____same_____ Additional PM comments: *Applicant proposed alternate, off-site mitigation to account for difference between proposed (0.3 acre establishment, 1:1) and Corps assessment using checklist (0.99 acre establishment, 3.3:1). 0.69 acre of Corps assessment not met = 0.69/0.99*100 = 70%. 70% of impact unmitigated = 0.21 acre of impact. See column B.	Column B: 1. Baseline ratio from step 2 or 3 = __:__ 2. Total adjustments = ___ 3. Final ratio: _4.0_ : _1_ Remaining impact: ___0.21 acre_ Required mitigation: _0.84_ acre ___ linear feet of Mitigation type: _enhancement_ Resource type: __non-tidal WL_ Cowardin or HGM: palustrine, depressional wetland Additional PM comments: Applicant originally proposed 0.6 acre of off-site enhancement via bank. Through checklist, I've determined requirement should be 0.84 acre. Applicant has agreed to provide 0.84 acre of wetland enhancement credit at XYZ bank.	Column C: 1. Baseline ratio from step 2 or 3 = __:__ 2. Total adjustments = ___ 3. Final ratio: __ : __ Remaining impact: _____ Required mitigation: ___ acre ___ linear feet of Mitigation type: _____ Resource type: _____ Cowardin or HGM: _____ Additional PM comments:
10	**Final compensatory mitigation requirements:**	PM summary: The final compensatory mitigation requirement for this impact site is 0.3 acre (900 linear feet) of on-site riverine-intermittent stream (realignment of Tullay Creek, mature willow woodland) and 0.84 acre of off-site enhancement of depressional wetland through the XYZ mitigation bank.		

Attachment 6: Checklist in Excel Format

| | | |

Frequently Asked Questions (FAQ)

- **Q1: Do I have to complete this checklist for all my Regulatory projects?**
  - A: Not for all projects. Completing the checklist is an SPD requirement for any project requiring compensatory mitigation.
- **Q2: What do you mean by "remaining impact" or "unmitigated impact"?**
  - A: This is the difference between an applicant's initial, proposed mitigation and the mitigation requirement determined by the PM (using the checklist). If the latter is greater, the applicant may agree to the higher mitigation amount, or PM may use additional columns to evaluate additional mitigation sites/types.
- **Q3: Can I use any functional/condition assessment for step 3?**
  - A: Yes, if it is approved by your district and complies with district (or upcoming regional) mitigation and monitoring guidelines. Acceptable functional/condition assessment methods must be aquatic resource-based, standardized, comparable from site to site, peer-reviewed, unmodified, and approved by the applicable Corps District. Any such method should fit into the before-after-mitigation-impact (BAMI) structure and adjustment formula.

FAQs (continued)

- **Q4: should checklist be attached to decision documents?**
  - A: Yes.
- **Q5: Why are steps 3 and 5 mutually exclusive?**
  - A: On the question of whether the checklist should treat consideration of a "functional/condition assessment" (step 3 for quantitative comparison of functions/condition metrics) and "net loss of aquatic resource area" (step 5) as mutually exclusive, if a functional/condition assessment method is used that explicitly accounts for area (such as HGM), they should be mutually exclusive; however, if a method is used that does *not* explicitly account for area (such as CRAM), then both steps should be used.

FAQs (continued)

- **Q6: Why are adjustments added? Why not multiplied or averaged?**
  - A: These would all be equally valid methods for combining the steps of the checklist; however the PDT chose to add the adjustments and the individual adjustments are calibrated with addition in mind. Multiplying or averaging would require numerically different adjustments, although the final outcome would be the same.
- **Q7: For step 2: why is a range of -2 to 4 suggested?**
  - A: To account for preservation-only mitigation proposals (where functional gain would be zero), a higher penalty (mitigation ratio adjusted upwards) was deemed appropriate by the PDT (hence the upward limit of 4). The opposite case (zero functional loss) doesn't occur for projects where compensatory mitigation is required to offset permitted impacts. For this reason, the potential downward adjustment was limited to -2.
- **Q8: How do I qualitatively compare functions?**
  - A: Using a list of functions (HGM functions are provided on checklist as an example, but other lists can be used instead), the project manager should compare the proposed impact (functional loss) and proposed mitigation (functional gain) at impact (I) and mitigation (M) sites (see example 7 in attachment 12501.3). For most functions, if $I < M$, then use adjustment less than 0 and equal or greater than -2.0; if $I = M$, then use adjustment of 0; or if $I > M$, then use adjustment greater than 0 and less than or equal to 4. This comparison should not be a numerical calculation of change for individual functions, but rather a qualitative and relative estimate of change for each function.

FAQs (continued)

- **Q9: How did the PDT come up with these specific adjustments? Aren't these numbers subjective? How do you address that?**
  - A: Yes, they are subjective to some extent (this is unavoidable); however, these instructions contain specific numeric adjustments (discrete, e.g., +1.0, or ranges, e.g., +0.25 to +4.0) that were determined by the PDT after assessing a variety of impact-mitigation scenarios and determining adjustments for each step that, in combination with other step adjustments, produce a reasonable range of final mitigation ratios. For steps where a range of adjustments is provided, PMs are directed to the attached examples for additional guidance. In coming up with these numbers, we did NOT want to come up with a rigid series of equations or overly-specific requirements. Rather, we sought to provide examples and instructions with clearly-explained rationales for making various adjustments. The PM is free to deviate from these, as long as justification is provided in the checklist. The checklist requires a PM to explain in writing his/her determination for a particular mitigation ratio rather than simply cite "best professional judgment" as in the past. Will applicant's argue over a PM's choice of specific adjustments? Yes, but this is no different than past negotiations on mitigation requirements, and our determinations should be based on scientific information, facts, field data, etc. Also, level of analysis should be commensurate with level of impact, and arguing over small numerical differences (+0.01 vs. 0.02) would be a waste of project manager time and resources. In the end, the Corps makes its determination of mitigation requirements, and permittees can appeal if they desire.
- **Q10: Step 2 and 5 seem to double count (double penalize) Preservation-only.**
  - A: Project managers should use their judgment. If the preservation-only mitigation proposal has been adequately accounted for in one step, the project manager can note that in the other step; however, both functional gain (or lack of) and net loss of area should be considered.

FAQs (continued)

- **Q11: How do you know functional gain if a bank is being used?**
  - A: From the mitigation rule, page 19685 under 332.8 for banks and ILF's: "(2) Assessment. Where practicable, an appropriate assessment method (e.g., hydrogeomorphic approach to wetlands functional assessment, index of biological integrity) or other suitable metric *must* be used to assess and describe the aquatic resource types that will be restored, established, enhanced and/or preserved by the mitigation bank or in-lieu fee project. (3) Credit production. The number of credits *must* reflect the difference between pre- and post-compensatory mitigation project site conditions, as determined by a functional or condition assessment or other suitable metric." In summary, a bank or ILF instrument should have included some estimate of expected functional gain. If the bank never did a before assessment, a project manager can work with the bank/ILF POC (or have the sponsor prepare) an estimate of before conditions using the chosen assessment method. For most ratio determinations using the BAMI comparison, the "after" condition would be estimated prior to the mitigation ratio determination; however in this case, the "before" condition at the bank site would also be estimated. For most banks/ILF's, there should be sufficient information of pre-existing conditions to make a "before" analysis possible. The only difference being that, for constructed banks/ILF's, it would not be possible to verify the "before" estimate with real data as could be done for "after" estimates through post-impact and post-mitigation (monitoring) assessments.

- **Q12: Step 7: if a financial assurance is required and step 7 adjusts the ratio upwards for uncertainty, isn't this double-penalizing?**
  - A: No, because despite having a financial assurance, the on-the-ground uncertainty does not disappear, and in order to ensure that mitigation successfully offsets impacts, additional mitigation may be required on the assumption that some portion of the site may fail, or that the overall site may never reach the expected/predicted level if functioning (in which case, the Corps may need to fund mitigation elsewhere if the permittee fails to do so).

FAQs (continued)

- **Q13: How can I base a ratio on CRAM scores using a numerical formula?**
  - A: using the checklist, CRAM is used quantitatively to compare functional gain and loss at the mitigation and impact sites, respectively; however, this is just one of among several steps of the checklist, each with its own adjustment. In other words, the numerical impact-mitigation comparison result does not directly, by itself, determine the mitigation ratio.
- **Q14: CRAM has a documented level of user error. How does this affect the ratio determination?**
  - A: Every functional/condition assessment method has some level of error. In addition, using a quantitative (or arguably semi-quantitative) method to compare functional gain and loss at the mitigation and impact sites, respectively, likely has less error than the undocumented error associated with "best professional judgment"-based determinations. Also, this is just one of among several steps of the checklist, each with its own adjustment.
- **Q15: If a multi-agency ratio-setting method has been established in my area, do I still need to use the checklist instead?**
  - A: Yes, the checklist should be completed, but you **can** continue to use the multi-agency method. You should fill out the top and bottom portions of the checklist, attach the results using the multi-agency method, and place these documents into the file as part of the administrative record.

FAQs (continued)

- **Q16: What if I get a zero (0) or negative result on the checklist?**
  - A: See August 2012 update slides below.
- **Q17: How does the mitigation preference hierarchy from the 2008 mitigation rule affect the checklist? Is the order of the mitigation types in the different columns important?**
  - A: The mitigation checklist is *not* designed to influence a decision regarding the preference hierarchy as stated in the mitigation rule (banks > ILF > permittee-responsible, unless deviation is warranted). That is a separate determination a project manager must make, but the checklist does not address it. Consequently, the order of mitigation types in columns A-C of the checklist isn't important. On-site mitigation, if being considered, can be in column A or B or C, depending on how the project manager wants to use the checklist.

FAQs (continued)

- **Q18: Do I need to complete the checklist for emergency projects, “self-mitigating” projects, or projects with very small impacts?**
  - A: Not necessarily. The project manager must determine whether compensatory mitigation is required or not. If a determination is made not to require compensatory mitigation, the checklist requirement would not be applicable.
- **Q19: Can I suggest changes to this procedure?**
  - A: Yes, this is a QMS procedure and comments can be added using the QMS system. Periodic updates/improvements are likely to occur. (But try it a few times first!)

FAQs (continued)

- ***New* Q20: For new mitigation banks and ILF programs, can/should these include a procedure for setting mitigation ratios?**

  - From 33 CFR 332.8(r): "The district engineer will determine the number and type(s) of credits required to compensate for the authorized impacts." Based on part (r) above, there is no requirement for bank sponsors to have any kind of crediting scheme that establishes compensatory mitigation ratios. In the past in SPD, there may have been a need for bank-specific ratio-setting procedures given there was no general procedure in place. Now for SPD, mitigation ratio determinations should be made on a project-specific basis to compare the proposed impacts with proposed mitigation using the SPD Standard Operating Procedure for Determination of Mitigation Ratios (QMS No. 12501, aka mitigation ratio checklist). Banks and ILF programs will still need a methodology for determining the numbers and types of credits to be generated (via functional assessment or otherwise) and perhaps limitations on their use. In addition, from 33 CFR 332.8(d)(6)(iv(C), ILFs should include "A methodology for determining future project-specific credits and fees." This makes sense given any ILF will have multiple restoration projects with (potentially) different types of mitigation used at different sites warranting generation of varying amounts and types of credits. However, as for banks within SPD, mitigation ratio determinations involving ILF credits should be made on a project-specific basis to compare the proposed impacts with proposed mitigation using the SPD Standard Operating Procedure for Determination of Mitigation Ratios. Note: there is flexibility to allow for banks with special circumstances to have specific mitigation ratio specifications if the Corps, in coordination with the IRT, determines it is beneficial to the aquatic environment. However, the use of credits at the majority of banks would be governed by the mitigation checklist. Examples of banks with special circumstances could include banks for marine areas (open water, eel grass, artificial reefs etc.) which typically have lower ratios than freshwater systems, especially when other pre-existing ratio policies are in place (e.g., NMFS Southern California eelgrass policy).

FAQs (continued)

- ***New* Q21: When using ILF programs, what information do I need in order to use the checklist?**

  - All the same information as for permittee-responsible or mitigation banks is required in order to complete the checklist. Consequently, project managers will need to obtain more information from ILF sponsors than they may have requested in the past. For proposed use of ILF programs, the project manager should request information necessary to complete the checklist such as: the proposed habitat type(s), Cowardin or HGM type(s), location, mitigation type (establishment, rehabilitation, re-establishment, enhancement, or preservation-only), description of required long-term maintenance of any structures, description of hydrology, and the probable timing of the mitigation (and any other sources of uncertainty). For ILF programs with a "standing proposal" ready to implement or an on-going project with available credit, temporal loss may be zero or minimal. If the ILF would need to develop a new project “from scratch,” temporal loss may be substantial enough to be accounted for in the checklist depending on the anticipated delay between implementation of impacts and mitigation.

- ***New* Q22: How is landscape connectivity within watershed incorporated into ratio-setting procedure?**

  - Currently landscape connectivity (extent to which aquatic resource at mitigation site connects to surrounding aquatic resources or associated upland habitats across landscape over relatively large extents) should be part of the impact-mitigation comparison (step 2 or 3). When using step 2 (qualitative comparison), functions related to the maintenance of plant and animal communities can include consideration of landscape connectivity. For step 3 (quantitative comparison), some functional/condition assessment methods, such as CRAM, explicitly account for landscape connectivity.

FAQs (continued)

- ***New* Q23: What are the highest ratios possible using the mitigation ratio-setting checklist procedure when preservation-only is proposed?**

  - When using step 2 (qualitative comparison), adjustments for preservation-only mitigation, which provides no functional gain, should generally fall towards the high end of the range (towards 3-4) (note: with the starting ratio of 1:1, this would result in a total step 2 adjustment of 4-5). Preservation-only of non-aquatic habitats (upland buffer) may warrant adjustments higher than 4. For step 3 (quantitative comparison using BAMI), higher ratios are possible. As an example using CRAM, if functional loss at impact site equals -100 (total loss of pristine aquatic resource) and expected functional gain equals 1 (a "1" would need to be used in BAMI instead of 0 to avoid a "divide by zero" undefined error), the resulting adjustment would be 100:1. However, in such cases, the adjustment may be modified by the Corps to ensure required compensatory mitigation is appropriate to the scope and degree of the impacts (see 33 CFR 320.4(r)(2)).

January 2012 update

Revisions to QMS document (12501):

- At SPD's direction, added to section 2: "Subordinate offices or organizations shall not modify this procedure to form a specific procedure."
- QMS section 2.0: added date for applicability (all permit applications received after April 20, 2011).
- Added statement that PM justification is required, not optional.
- QMS step 7.6: changed "Note: The process outlined herein can also be used for determining compensatory mitigation requirements for unauthorized activities." To "Note: The process outlined herein can also be used for determining compensatory mitigation requirements for unauthorized activities for which the Corps is the lead enforcement agency."
- Added training presentation to attachments

January 2012 update (continued)

Revisions to attachment 12501.1 (checklist):

- Change to steps 2 and 3: **dropped threshold-based criteria** for whether to use step 2 (qualitative impact-mitigation comparison) or step 3 (quantitative comparison using a functional or condition assessment) and replace with: “Has a Corps-approved functional/condition assessment been obtained?” If not, step 2 is used; otherwise, step 3 is used. Thresholds (0.5 acre, 300 linear feet) moved to in instructions as recommendations for when a functional/condition assessment should be required.

- Based on coordination with Office of Counsel and HQ: on the question of whether the checklist should treat consideration of a "functional/condition assessment" (step 3 for quantitative comparison of functions/condition metrics) and "net loss of aquatic resource area" (step 5) as mutually exclusive, if a functional/condition assessment method is used that explicitly accounts for area (such as HGM), they should be mutually exclusive; however, if a method is used that does *not* explicitly account for area (such as CRAM), then both steps should be used. [change also made in instructions and examples]

January 2012 update (continued)

Revisions to attachment 12501.2 (instructions) and 12501.3 (examples):

- Instructions: Added statement that PM justification is required, not optional.
- Instructions: Added note to step 2: “adjustments for preservation-only mitigation, which provides no functional gain, should generally fall towards the high end of the range (towards 3-4). Preservation-only of non-aquatic habitats (upland buffer) may warrant adjustments higher than 4.”
- ~~Instructions: Last page: Compute log of quotient multiplied by 2.5 to obtain adjustment for step 4. [change “4” to “3”]. Input Step 4 adjustment into the checklist document. [change “4” to “3”]~~
- Example 3 – column B > re-examine functional loss vs. gain > loss is probably higher than gain. Changed mitigation type in column B to “establishment”, matching type on introduction page.
- Example 5: Step 2 states rehabilitation does not provide functional gain—this is not correct: From the mitigation rule, “Rehabilitation” means the manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function, but does not result in a gain in aquatic resource

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August 2012 update

Revisions to checklist and instructions:

- Modified checklist procedure to use a variable "baseline ratio" determined by step 2 or 3. For either step, the "starting ratio" is 1:1 (rather than 0:1) and is modified by step 2 or 3's adjustment to determine the baseline ratio.
  - Previously, the adjustments were added starting from 0 (starting ratio of 0:1).
  - PDT determined 1:1 is the correct starting point from which to make ratio adjustments.
  - Rationale: one cannot have more functional loss at the impact site than functional gain at the mitigation site and end up with less than a 1:1 ratio (except perhaps if going from a common habitat type to a rare one).
  - To illustrate the point, in the simplest case of steps 4-8 of the checklist being 0 (assuming no uncertainty, no temporal loss, etc. which is realistic if a mitigation bank is proposed), and the project manager uses step 3 of the checklist (Before-After Mitigation-Impact functional comparison) on a situation where functional loss at the impact site equals functional gain at the mitigation site. If the project manager adds 0 to a "starting ratio" of 0:1 (per the previous checklist procedure), the result would be a 0:1 final ratio (no mitigation required) which does not make sense. However, if instead the project manager adds 0 to a "baseline ratio" of 1:1, the final result would be 1:1 which conceptually agrees with the equal values for functional loss and gain.

August 2012 update (continued)

Revisions to checklist and instructions:

- Modified step 2 (qualitative comparison of functional gain and loss):
  - Would incorporate a "starting ratio" of 1:1 which would then be modified based on an adjustment range of -2 to +4 (modified from previous range of -2 to +5 to matching the PDT's original intended range based on previous scenarios and examples).
- Modified step 3 (BAMI procedure for quantitative comparison of functional gain and loss):
  - Logarithmic conversion replaced with a simplified procedure using the quotient of mitigation-delta over impact-delta. Depending on result, quotient is added to the left (mitigation) OR right (impact) side of the starting ratio (1:1) to set the baseline ratio.
  - Added a statement to the instructions cautioning PMs against considering extreme mitigation proposals: In an extreme case, the BAMI procedure could result in a ratio (and overall mitigation proposal) unacceptable to the Corps. For example, providing a very large but low quality mitigation site (low functional gain resulting a in a very high ratio) may result in functional gain equaling loss

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August 2012 update (continued)

Revisions to checklist and instructions:

- Modified checklist to incorporate “negative” results:
  - For step 6 (type conversion), it is possible to obtain a negative adjustment (for example, if a low value aquatic resource is proposed to be replaced by a high value and/or rare aquatic resource).
  - For step 9, if total of adjustments is greater than 0 (positive), add total to left (mitigation) side of baseline ratio; however, if total of adjustments is less than 0 (negative), add ABS of total to right (impact) side of baseline ratio.
  - Rationale for change: if a functional or condition assessment is used for step 3 (currently infrequent), and is coupled with proposed mitigation at a bank (especially with bank credit for re-establishment or establishment), a negative checklist result is a likely outcome. Likely cases would be where no/little loss of waters would occur, and functions would be decreased slightly by the addition of minimal structures, etc. Given the increasing likelihood of obtaining a negative ratio result from the checklist as the use of functional/condition assessments increase, the PDT spent some time discussing how to incorporate a negative result. Assuming a given project would incur impacts requiring compensatory mitigation, a negative result where functional gain is greater than the loss should logically “translate” into a ratio somewhere between 0 and 1 (not negative). This reflects credit for the higher functional gain but still requires some compensation. To implement this logical framework, the checklist was modified so that a total negative adjustment (when all adjustments are added at the end of the checklist) would be added to the right side of the mitigation-impact ratio (M:I). Under these proposed, modified instructions, if all step adjustments total 0, the project manager would obtain a 1:1 final ratio. If all step adjustments produce a positive adjustment total (the typical scenario), the project manager would add this total to the "left side" of the ratio (i.e., the mitigation side). For example, if step adjustments total 0.6, the final ratio would be 1.6:1. Conversely, if all the step adjustments produce a negative adjustment total (rare, requires use of step 3 with a quantitative functional/condition assessment), the project manager would add the value of this total to the "right side" of the ratio. For example, if step adjustments total -0.6, the final ratio would be 1:1.6 (alternatively expressed as 0.625:1). In this latter case, the negative sign would result in a mitigation requirement below 1:1 but still greater than 0. Using these modified instructions, all positive adjustments would result in ratios greater than 1:1 and all negative adjustments would result in ratios less than 1:1.

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August 2012 update (continued)

Revisions to checklist and instructions:

- Updated original five examples and added three new examples, two of which incorporate the step 3 BAMI procedure.
- Added two new FAQ's to training presentation (No.'s 20 and 21) related to use of the checklist with mitigation banks and ILF programs.
- Added checklist in Excel format (attachment 6)

November 2012 update

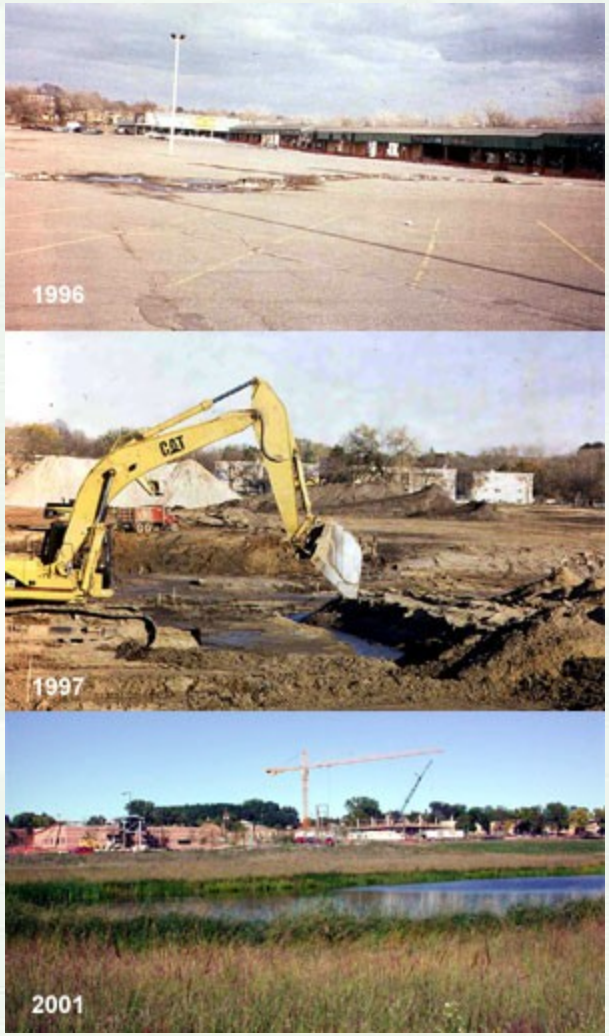
Revisions to checklist and instructions:

- Corrected final score equations in the BAMI spreadsheet (attachments 4 and 6);
- Clarified language in instructions for step 2 to indicate only a single adjustment should be used for all functions combined (i.e., each function doesn't have a separate adjustment) (attachments 2 and 6);
- In response to suggestions, added table for step 2 to checklist in attachments 1 and 6 (as shown in example 7).

POC's (PDT)

- **SPA: Deanna Cummings**
- **SPD: Thomas Cavanaugh**
- **SPK: Will Ness**
- **SPL:**
  - **Dan Swenson (PDT lead)**
  - **Corice Farrar**
  - **Spencer Macneil**
  - **Michelle Mattson**
  - **Sallie McGuire**
  - **Stephen Estes**
  - **John Markham**
- **SPN:**
  - **Laurie Monarres**
  - **David Wickens**
  - **Sahrye Cohen**

Questions?



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